

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Subsystem: Master Schedule and Overview
WBS: All
Date Submitted: 8/11/00
Submitted By: Harry Weerts, Bill Freeman

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	M1-Solenoid Delivered to Fermilab	5/12/97	5/12/97	0 w
X	M2-Central Preshower Module Fabrication Complete	12/16/97	12/16/97	0 w
X	M2-Central Preshower Installed on Solenoid	5/21/98	5/21/98	0 w
X	M1-Solenoid Installed and Tested	9/30/98	9/30/98	0 w
X	M3-Level Ø-South Installed	5/8/00	2/9/00	12.6 w
X	M2-Muon End Toroids Installed on Platform	8/4/00	11/15/00	-14.2 w
	M1-Begin Shield Wall Removal/Ready to Roll-in	11/1/00	11/22/00	-3 w
	M1-Detector Rolled-in and Hooked Up	2/6/01	2/2/01	0.4 w

Note: The full set of reportable milestones are collected and sorted by date at the end of this report. Also, a separate monthly report for the solenoid project will no longer be included, since that project is now formally complete. The reportable milestones associated with the solenoid project are now included in the above list.

Areas of Concern

Technical

Refer to the WBS level 3 system reports.

Schedule

The remaining schedule concerns are related to the silicon subsystem and the electronics readout systems.

Resources

None

Cost

None

Change Requests

None

Progress Summary

With the arrival and installation of the completed fiber tracker in the DØ Run II detector, most activities have now shifted towards the assembly building. The installation phase of the experiment is in full swing and the installation of the fiber tracker has set in motion a series of moves of large detector pieces, which will result in a final configuration that will not change anymore until detector roll in. It is anticipated that these moves will be completed by the middle of August. Progress is now very obvious in the collision hall and except for the silicon system, all systems are now in the installation phase. To keep up with the work in the assembly hall, we have established shifts for physicists to help with mechanical infrastructure (cabling etc.), which consists of 8 person shifts per day.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Subsystem: Silicon Tracker
WBS: 1.1.1
Date Submitted: 7/21/00
Submitted By: Marcel Demarteau, Ron Lipton

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	H Half-Wedge Fabrication 20% Complete	10/15/99	10/15/99	0 w
X	3 Chip Ladder Fabrication 80% Complete	10/26/99	10/20/99	0.6 w
X	9 Chip Ladder Fabrication 20% Complete	11/4/99	11/3/99	0.2 w
X	F Wedge Assemblies 20% Complete	1/24/00	1/19/00	0.4 w
X	6 Chip Ladder Fabrication 20% Complete	1/31/00	1/3/00	3.86 w
X	H Half-Wedge Fabrication 80% Complete	3/29/00	2/23/00	5 w
X	6 Chip Ladder Fabrication 80% Complete	7/12/00	3/14/00	16.8 w
	M2-First Silicon Tracker Barrel/Disk Module Complete	7/28/00	1/24/00	26.4 w
	F Wedge Assemblies 80% Complete	8/1/00	4/26/00	13.3 w
	9 Chip Ladder Fabrication 80% Complete	8/2/00	3/27/00	17.9 w
	South H-Disks Ready to Move to DAB	8/4/00	7/3/00	4.6 w
	South Half-Cylinder Complete and Ready to Move to DAB	9/11/00	8/1/00	5.8 w
	M3-All Silicon Tracker Barrels/Disks Complete	10/27/00	8/25/00	9 w
	North Half-Cylinder Complete and Ready to Move to DAB	10/27/00	9/18/00	6 w
	M1-Central Silicon Complete	10/27/00	9/18/00	6 w
	M2-Silicon Tracker Installed in Solenoid/Fiber Tracker	12/15/00	9/25/00	11.6 w

Areas of Concern

Technical

Due to concerns for failing grounding connections we have moved to using Indium soldering. The procedure seems quite reliable but is very time consuming and will have some impact on the completion of completed barrels. There have been further studies of the cross talk observed in our signals. The main worry is the cross talk induced on the signal that validates and strobes the data bus lines. A spurious signal on this line causes additional data strobes and can completely invalidate the data readout. The cross talk is induced in the hdi and low mass cable system. A solution has been found and will be implemented in the digital readout. It implies that another faster FPGA will have to be mounted on the interface card, which requires some design changes.

Schedule

Parts deliveries continue to be a concern. Nine chip ladder production is limited by HDI availability. The lamination and surface mount of components is being followed very closely and every effort is given to ensure that no further delay is incurred. Six chip ladder production is paced by the delivery of sensors. We are also monitoring the production rate of low mass cables at the DOE Kansas City Honeywell plant. A solution has been found for the cross talk problem in the validation and strobe signal for the data lines. This implies some design changes in the interface card which will delay the delivery of the first pre-production modules that will be used for testing. Because of these problems the 10% test will most likely be run with earlier versions of the interface cards and not the final production modules.

Resources

A number of experienced physicists are leaving the project to take other positions or to return from visiting positions at Fermilab. We have not been able to find new additional, permanent personnel, but have identified replacements for the summer period. We are concerned that this loss may slow the project.

Cost

There is continued cost exposure in the installation, cooling and final assembly tasks. Currently a full cost estimate is being made for completing the detector. The plan is to submit change requests next month.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Change Requests

None

Progress Summary

The first two barrels and four disks of the DØSMT have been assembled. The third barrel is underway and has clearly benefited from the lessons learned on the first two barrels and should be completed early July. The 10% test continues to be an important system to test and debug electronics and systems. We are setting up the infrastructure to read out a disk with this system, and good progress is being made. Mechanical work on the half cylinder support assemblies is progressing well and the final cylinders were installed in the central fiber tracker in June for alignment work. The design and production of installation fixtures is in progress. Ladder and wedge production and testing is proceeding smoothly, with the rate limited by parts availability and capacity of the burn-in testing systems.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Subsystem: Fiber Tracker and VLPCs
WBS: 1.1.2
Date Submitted: 7/13/00
Submitted By: Alan D. Bross

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
	<i>Detector</i>			
X	M2 - Assembly Design Complete	3/5/99	3/5/99	0 w
X	M2-First Cylinder Complete	9/2/99	9/2/99	0 w
X	M3-Fiber Tracker Ribbon Fabrication 50% Complete	11/5/99	11/12/99	-0.9 w
X	M2-Fiber Tracker Assembly Begun	2/1/00	12/6/99	6.2 w
X	M3-Fiber Tracker Cylinders 8, 7, 6, and 5 Complete	3/2/00	1/28/00	5 w
X	M3-Fiber Tracker Ribbon Fabrication Complete	5/10/00	3/6/00	9.5 w
X	M3-Fiber Tracker Ribbon Mounting Complete	5/13/00	4/20/00	3.3 w
X	M2-Fiber Tracker Assembly Complete	5/26/00	5/4/00	3.3 w
	Waveguide Production 50% Complete	7/31/00	1/29/00	25.7 w
	M3-Waveguide Production Complete	8/16/00	6/5/00	10.4 w
	<i>VLPCs</i>			
X	M2-VLPC Production 50% Complete	8/31/97	8/31/97	0 w
	M3-VLPC Cryo System Operational	8/15/00	6/12/00	9 w
	M3-VLPC Cassette Assembly 50% Complete	8/17/00	4/12/00	17.7 w
	M3-VLPC Cassette Assembly Complete	10/13/00	8/22/00	7.4 w

Areas of Concern

Technical

None

Schedule

None

Resources

Replace/augment manpower for VLPC cassette assembly and test.

Cost

None

Change Requests

None

Progress Summary

- Central Fiber Tracker installed in DØ detector on June 29.
- 22 production cassettes completed.
- The technical manpower used to assemble the fiber tracker is now part of the team producing waveguides. Waveguides are assembled at Fermilab, Indiana Univ. and Univ. of Notre Dame. 100 production waveguides have been completed.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Subsystem: Forward Preshower
WBS: 1.1.4
Date Submitted: 7/7/00
Submitted By: Abid Patwa

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	M2-Forward Preshower Module Fabrication Begun	11/4/98	11/4/98	0 w
X	M3-1st Forward Preshower Detector Complete	2/24/00	1/12/00	6.2 w
X	Module Fabrication and Testing Complete	4/1/00	12/10/99	14 w
X	M3-2nd Forward Preshower Detector Complete	4/3/00	3/8/00	3.6 w

Areas of Concern

Technical

None

Schedule

None

Resources

None

Cost

None

Change Requests

None

Progress Summary

- Final channel-to-channel mappings of FPS clear waveguides from the detector to VLPC cassettes were established for different module types (large, small, special) in the detector.
- Plans to survey the south EC as well as the existing v-star targets on respective FPS modules following the move of EC-south onto the platform were developed.
- Final prints for the four FPS cable winders needed to accommodate clear waveguides were given to the Fermilab shop for machining.
- Initial designs of the framework for the FPS/CPS calibration system and readout hardware ORACLE database were made.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Subsystem: Tracking Electronics
WBS: 1.1.5
Date Submitted: 7/21/00
Submitted By: Marvin Johnson, Fred Borcharding

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	First Readout Crate Installed & Working	11/16/99	12/2/99	-2 w
X	10 Digital Boards Available	7/28/00	3/22/00	18 w
X	Ten 8-chip Analog Boards Available	8/8/00	4/19/00	15.4 w
	Mixer Boards Ready	11/30/00	6/22/00	22.2 w
	Multichip Modules Received	1/30/01	2/23/00	47 w

Areas of Concern

Technical

None

Schedule

None

Resources

None

Cost

None

Change Requests

None

Progress Summary

Silicon Tracking

- Final commissioning of the silicon readout system has started. Fiber optic cables from the platform to the moving counting house are installed and we are trying to readout the entire system with a test silicon high density interconnect. Cables from the platform to the interface cards are being installed. Other than simple connection errors, no problems have been found. The south half should be installed before the silicon detector arrives.
- The interface card design is completed and the construction is out for bid. Fifteen cards are expected by September 15 and the balance about a month later.

Central Fiber Tracking

- The MCM substrate design was released on June 9 and production of the substrate has started. The packaging of the modules will begin about 8 to 10 weeks from this date. Extensive work was done in qualifying the MCM production test stand.
- The Analog Front End (AFE8 or 8-MCM) board was released for production of the first ten units on June 9. Boards were expected back by four weeks from that date, but vendor problems have already slipped that by three weeks. Layout of the two-board pair for the 12-MCM AFE was stretched out because the layout resources were used for the 8-MCM board and the mixer backplane.
- Work on the mixer box design continued. The special design tool was in use. Other details of the design such as the clock distributions, handling of the control bits and synchronization of the system were worked on. The system is near design completion.
- The first production articles of the Digital Motherboard were received and tested OK. The first article DFE tracking daughter boards were expected on July 1. Here again vendor problems with board fabrication have delayed delivery. The real delivery date is still undetermined. The double-wide daughter board PCB, which is

DØ Upgrade Monthly Progress Report

for the month of June, 2000

used for the collector and broadcaster was also delayed by the vendor, but was received and is being stuffed. The majority of the firmware for the CFT collector was completed and work on documentation is underway.

- Extensive work was done in building the fixturing required for the wave-guide installation testing. Eighty-nine SVX chips were packaged, shipped to Fermilab and tested. Ten extra stereo board PCBs were fabricated and kitted for stuffing. The STIB boards for these stereo boards were built and parts kitted. A mini-backplane was designed for the stereo boards. And a VLPC bias voltage supply board was designed. All of these and more fixturing will be built and commissioned in July for an August 1 target date.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Subsystem: Calorimeter Electronics
WBS: 1.2.1
Date Submitted: 7/1/00
Submitted By: Mike Tuts

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	SCA Testing Complete	11/23/99	12/15/99	-2.8 w
X	Shaper Hybrid 50% Complete	2/22/00	5/9/00	-11 w
X	M2-Calorimeter Preamp System Test Complete	7/13/00	3/31/00	14.4 w
	M3-Calorimeter CC,ECN Preamp Installation Complete	10/6/00	3/31/00	26.4 w
	Timing System Installed	11/13/00	8/18/00	12 w
	Daughterboard Vendor Production Complete	11/29/00	6/16/00	22.8 w
	BLS Motherboard Assembly Complete	12/12/00	8/7/00	17.6 w
	M2-Calorimeter BLS Assembly Complete	1/8/01	9/26/00	13.6 w

Areas of Concern

Technical

Progress has been made in improving the coherent noise seen in the BLS system. It appears that it was entering on power reference lines. Additional filtering has been added to the pre-production boards that are being built.

Schedule

We have incurred additional delays in the BLS system because of the additional debugging time required to understand the above noise problem. These additional delays do not delay the detector roll-in.

Resources

We continue to remain concerned that we have not replaced lost manpower. We may be able to mitigate some of the problem through physicist shifts, but that remains to be seen. As reported earlier, we remain concerned about having sufficient manpower in the Fall when our summer manpower goes away.

Cost

None

Change Requests

None

Progress Summary

- We have built and populated 500 pre-production BLS daughtercards.
- The pre-production BLS motherboards have been built and are being assembled, delivery is expected in 1 month.
- The preamp cooling system parts have been fully fabricated, delivery of the balance of the heat exchangers is expected shortly.
- Four preamp boxes have been prepped and the cooling systems are being installed.
- All preamp motherboards have been assembled, with 70 (of 1250) still to be tested.
- A final production BLS power supply has been built and tested; prep work has begun for the BLS power supply rework.
- All BLS transformers are in hand.
- The pulser interface board prototype has been built and tested in the final system.
- The BLS system ORC documentation has been completed and is under internal review.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Subsystem: Intercryostat Detector
WBS: 1.2.2
Date Submitted: 7/13/00
Submitted By: Andy White

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	M3-ICD Tile Modules/Boxes Ready	4/19/00	1/18/00	13.2 w
X	M2-ICD Modules Arrive at Fermilab	4/24/00	1/25/00	12.8 w
X	M3-InterCryostat Detectors Installed	5/5/00	2/1/00	13.6 w
	Drawers Ready	10/6/00	12/14/99	40 w

Areas of Concern

Technical

- Prototype cables have been received – but we need to determine the attenuation length.
- The final routing for the fiber cables on the end cryostats has not yet been determined.
- A solution needs to be found for our (and the FPD) VME needs for calibration systems (using the muon system LMB's).

Schedule

None.

Resources

We will need some Fermilab technical support to install the crate/block/backplane assemblies under the cryostats. We will also need support (welder/tech) to install links for the fiber cables on the faces of the ECs.

Cost

None

Change Requests

None

Progress Summary

- 80% of the backplane fiber pigtails have been made.
- 100 PMT's (R647's) have been tested at University of Texas -Arlington.
- 50% of drawers completed – to be tested.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Subsystem: Muon Central
WBS: 1.3.2
Date Submitted: 7 /12/00
Submitted By: Tom Diehl

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
	PDT Commissioning Complete	10/17/00	6/9/00	18 w
	CFA Commissioning Complete	11/22/00	7/10/00	19.3 w

Areas of Concern

Technical

- Progress on the two central muon gas systems has stopped. While many of the on-detector components such as the headers and distribution lines have been finished, gas isn't flowing because we lack connections to the muon gas room that will allow us to operate from a trailer. The technician who was previously working on our gas infrastructure has had his priorities redefined in such a way that he no longer has any time to finish the connections. That limits the number of chambers that we can put into operating condition. Furthermore, the design of the gas room components that control the flow rate and pressure is incomplete. The engineer, who as recently as two weeks ago had promised to get to this in August, has changed his priorities so that it won't be started until the end of September, at the earliest. It seems likely that we will not be operating with a recirculating gas system at roll-in.
- Progress connecting the Cosmic Cap and A- ϕ system scintillation counters has halted at 50% because of the late delivery of SFE cards. The forward muon system will continue to have priority in attaining the cards until they are at the 50% level.

Schedule

Delays in the completion of the recirculating gas system are likely to adversely affect the central muon commissioning schedule, as described above.

Resources

Commissioning manpower has grown to 6.75 FTE's for the month of June, including ¼ FTE post-doc, for the three subsystems that make up the central muon detector.

Cost

A foreseeable potential cost increase is the possibility of hiring a contract engineer to complete the gas system design.

Change Requests

None

Progress Summary

Commissioning is underway in earnest for all aspects of the central muon system.

- We have achieved a minor breakthrough in integration and commissioning in that we have read-out, at the same time and in the same run, 50% of the central muon scintillation counter front-end electronics along with two (out of ninety-four) PDTs.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Subsystem: Muon Forward Trigger Detectors
WBS: 1.3.3
Date Submitted: 7/3/00
Submitted By: Dmitri Denisov

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	M2-Muon Forward Trigger Counter Assembly 10% Complete	10/12/98	10/12/98	0 w
X	All Pixel Octants Assembled	2/23/00	4/4/00	-5.8 w
	All Muon Forward Trigger Detector Planes Installed	12/15/00	8/25/00	15.4 w

Areas of Concern

Technical

The high failure rate of LVPS in the front-end VME crates is a concern. About 50% of the power supplies had some sort of failure so far. The crates are to be located inside the collision hall, so their reliability is important. We are performing long-term under-load tests of all VME crates now.

Schedule

Installation of the trigger counters planes is delayed by a month in comparison with baseline schedule.

Resources

None

Cost

None

Change Requests

None

Progress Summary

Activities centered on the installation of A-layer planes and commissioning of front-end electronics. Eight A-layer octants have been moved from their assembly location at Lab F to DAB, where they have been assembled into pairs and the assembly of a full plane begun. The first front-end VME crate has been installed, cabled to MCH and the trigger framework, and calibration data have been collected using the DØ DAQ.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Subsystem: Muon Forward Tracker
WBS: 1.3.4
Date Submitted: 7/3/00
Submitted By: Dmitri Denisov

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	M2-Muon Forward Tracker MDT Assembly 10% Complete	1/29/99	1/29/99	0 w
X	Arrival Of C-Layer MDT Modules At FNAL	11/3/99	10/22/99	1.7 w
X	M2-All Muon Forward Tracker MDT Modules At Fermilab	3/30/00	3/10/00	2.8 w
	B-Layer Octants Assembled	9/1/00	4/18/00	19.2 w
	All MDT Octants Assembled	9/1/00	7/14/00	7 w
	Muon Forward Tracker B-Layer Planes Installed	11/9/00	6/15/00	20.6 w
	All MDT Planes Installed	11/9/00	8/4/00	13.6 w

Areas of Concern

Technical

Same concern about front-end VME crates as in 1.3.3

Schedule

The major concern is installation of C- and B-layer MDT octants, which in the current DØ schedule has considerable delay in comparison with baseline schedule (see table above). Late installation will leave limited time for detector commissioning before collider operation.

Resources

Rate of B-layer MDT octants assembly is limited by the number of Fermilab technicians in the Lab F team. This group has been reduced substantially during the month of June, which, in turn, caused a reduction in MDT octant assembly rate.

Cost

None

Change Requests:

None

Progress Summary:

- Installation of all sixteen A-layer MDT octants was finished. Preliminary tests of installed A-layer octants demonstrate no problems with low voltage, HV and gas systems. Long term tests of 24 VME front-end crates are in progress.
- Assembly of C-layer octants was finished on June 16. Design of C-layer mounting hardware was finished.
- Production of B-layer octants began, with two B octants been partly assembled by the end of June. Design of B-layer octants mounts has started.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Subsystem: Muon Electronics
WBS: 1.3.5
Date Submitted: 8/9/00
Submitted By: Boris Baldin

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	MDT ADB Fabrication Complete	12/2/99	12/2/99	0 w
X	MDC Fabrication Complete	1/31/00	12/13/99	5 w
X	M2-Muon Electronics Preproduction Installation Complete	1/31/00	12/13/99	5 w
X	FEB, CB Production Complete	4/10/00	1/3/00	14 w
	SFE, SRC Fabrication Complete	8/16/00	2/3/00	27.5 w
	MRC, MFC Production Complete	9/1/00	3/27/00	22.4 w

Areas of Concern

Technical

None

Schedule

None

Resources

None

Cost

None

Change Requests

None

Progress Summary

Three remaining projects in production (SFE, SLP and MFC) do not affect muon commissioning and installation schedule.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Subsystem: Trigger
WBS: 1.4.1-1.4.5
Date Submitted: 7/15/00
Submitted By: Gerald C. Blazey, Nikos Varelas

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	SLICs Received	12/10/99	11/10/99	4 w
X	M3-Establish Single Crate Internal Data Movement	2/17/00	1/6/00	6 w
	Preproduction MTCxx, MTFB, and MTCM Complete	8/9/00	1/24/00	28 w
	M3- Cal Readout Available to L2	8/15/00	2/11/00	26 w
	MBTs Received	8/28/00	3/16/00	23 w
	M3-L3 Operational (One Full Chain)	9/1/00	6/1/00	13 w
	Production MTCxx, MTFB, and MTCM Complete	9/21/00	6/27/00	12 w
	M3-Muon Level 1 Trigger Preproduction Testing Complete	10/20/00	4/18/00	26 w
	Global Installation Complete	10/24/00	7/12/00	14.6 w
	L2 Cal Installation Complete	10/24/00	8/21/00	9 w
	L2 CTT Installation Complete	10/24/00	8/9/00	10.6 w
	L2 Muon Installation Complete	11/7/00	7/26/00	14.6 w
	Alpha Cards Received	12/18/00	5/15/00	30 w
	M3-Trigger Level 2 Commissioned	3/28/01	9/21/00	25.6 w

Areas of Concern

Technical

None

Schedule

The final delivery date of the Level 2 MBT boards has slipped due to a second pre-production prototype phase and vendor delays. There is a delay on the delivery of VRC's and Segment Bridges for the Level 3 system.

Resources

None

Cost

None

Change Requests

None

Progress Summary

Framework

Progress was made on the testing and debugging of trigger framework scalars.

Luminosity Monitor

The TDC board design was completed this month and PCB layout has begun. Work has also begun on the FPGA design for the Vertex board.

Level 1

The prototype Terminator Attenuator board for the Calorimeter Trigger Pickoff signals was assembled and tested. The testing of the pre-production version of the muon trigger card (MTCxx) and its associated flavor boards (MTFB's) continued this month. The delay in the delivery of serial link cards (SLDB's) from the assembly house continues. Key electronics is over two months late in the delivery of the boards. The production crate manager (MTCM) and the

DØ Upgrade Monthly Progress Report

for the month of June, 2000

pre-production MTC05 flavor board were submitted for layout. The testing of the prototype muon centroid crate manager (MCCM) continued. Two of the seven pre-production muon centroid finder cards (MCEN's) have been assembled. Initial testing of these cards looks good. The layout of the pre-production centroid finder daughter board (MCPB) is in progress. The majority of the firmware for the CFT collector was completed and work on documentation is underway. Progress was made on the firmware for the FPS DFE and BC boards.

Level 2

The communication chain FIC-to-SFO-to-SLIC, was exercised extensively in early June and errors were detected and fixed on both the FIC and SFO. A thorough list of SFO integration tests at the end of June showed satisfactory results. A list of minor layout modifications and improvements to the SFO and CIC boards, which resulted from discussions with Fermilab engineers, were identified and will be implemented in the production boards. A pre-production MBT board was sent out for assembly and expected to arrive the week of July 10. The remaining 29 MBTs were sent out at the same time, and will be stuffed if the pre-production prototype checks out all right. VME controllable BIST mode with error and event counters (input) was implemented on SLIC input and output channels. Three spare SLICs were received from assembly house. Work on the assembly of the Level 2 rack and cables started.

Level 3

Progress was made on the Level 3/DAQ control systems' capability for reading out events with blocks from different detector crates (so-called multi-VRC operation), and for multiple run operation. The support efforts for the readout of tracking, muon, and calorimeter digitization crates continued and were crucial for the continued progress of these detector groups in testing and debugging the front-end electronics. Excellent progress was made on the Level 3 filtering code and the trigger simulator. With a basic complement of filters and tools and a complete trigger list, we were able to run the Level 3 ScriptRunner with the Level 1/Level 2 simulator linked in.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Subsystem: Online
WBS: 1.5.1
Date Submitted: 8/11/00
Submitted By: Stuart Fuess

<u>Done</u>	<u>Reportable Milestone</u>	<u>Date</u>	<u>Baseline</u>	<u>Variance</u>
X	Steady DAQ Running	3/17/00	3/31/00	-2 w

Areas of Concern

Technical

None

Schedule

None

Personnel

None

Cost

None

Change Requests

None

Progress Summary

- Supported installation in Moving Counting House of readout electronics for CFT.
- Considerable development of standard Control System application frameworks, toolkits, and GUI standards, allowing rapid and flexible development of specialized tools for detector commissioning and monitoring.
- Development and demonstration of a logging system for Control System data.
- Extension of Control System applications to Windows NT and Windows 2000 environments, allowing development of simple “test bench” applications.
- Development of tool for decoding and dumping raw data contents.
- Progress continues on calibration database designs for various detector elements.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

June '00 Financial Summary

The month of June fiscal year 2000 closed with obligations for the DØ Upgrade Project totaling \$4,010K on equipment M&S funds. Obligations on Solenoid AIP Plant funds will no longer be reported since the project closed during the month of April 2000. The spending plan now shows that spending is slightly lower than plan for FY00, but the difference is not significant enough for concern. At this stage of the Project, it seemed only crucial to plan for the future, thus the spending plan for October through April was made equal to spending. On the other hand, planned spending from May through September is a best estimate. The Project was allocated an M&S budget of \$3,104K during November. To cover Operating expenditures, the M&S budget was reduced by \$400K early in the fiscal year and an additional \$200K reduction occurred during April. DØ expects to spend the full FY00 budget, which is now \$2,504K. In addition to the Project's DoE funding, forward funding will be instituted to cover expenditures beyond the current fiscal year budget. A \$1,000K forward funding agreement has recently been established with SUNY Stony Brook. Michigan State, the University of Notre Dame, and Northern Illinois University have also agreed to provide support and are expected to provide funds in July 2000. The remaining DoE funding of \$3,708K will be allocated during fiscal year 2001.

The M&S Upgrade Project balance is currently \$3,614K, excluding contributions and contingency. Contributions to the Upgrade currently total \$1,442K. These contributions reduce the M&S balance. DØ Upgrade Spokespersons are in the process of negotiating additional contributions of approximately \$385K, but at this time, these funds are still unspecified. A new Cost Estimate is now being used in the determination of Project's estimate to complete (ETC), which remains equal to the Project's M&S balance. The overall cost of the Project has increased. A contingency estimate was developed as a result of a PPD Cost Review, which took place during March. The contingency, which is held by the Directorate, further increases the total Project cost. The total Cost Estimate increased by \$71K during April as a result of contingency usage requests approved by the Directorate.

The Solenoid Project is now complete. The unobligated AIP balance of \$282.4K will be transferred to Upgrade M&S Equipment as budget dollars to be spent this fiscal year. These budget dollars are expected to be transferred in July FY00.

The Project currently has commitments with universities and other institutions in the DØ Collaboration, via active Memoranda of Understanding (MoU), totaling \$4,915K. These funds represent an obligation on the part of the DØ Upgrade Project and are regularly costed each month via invoices received from these institutions as work is completed. In addition, several institutions have made significant contributions to the DØ Upgrade. A list of the universities and other institutions involved, as well as a more detailed breakdown of the commitments and costs, follows.

DØ Upgrade Monthly Progress Report

for the month of June, 2000

FY00 Financial Report as of 6/30/00

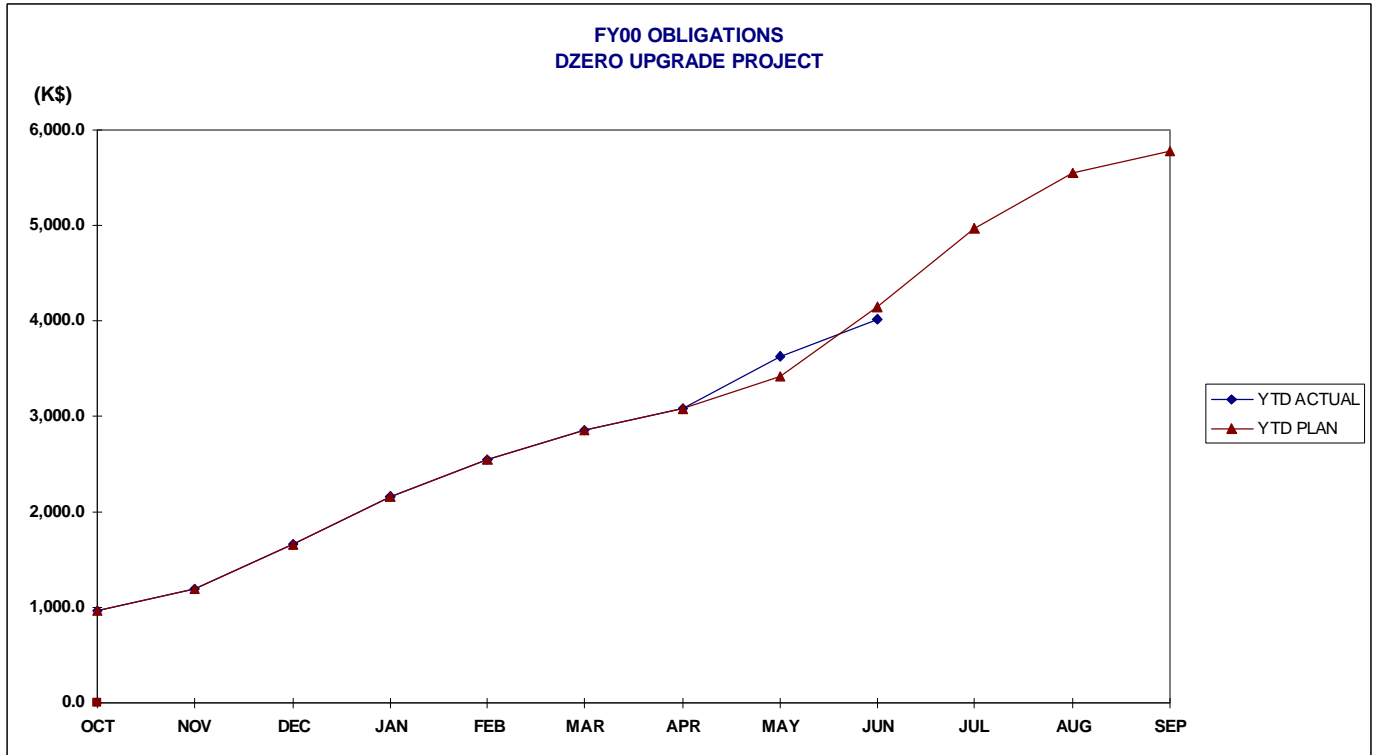
		<u>COST ESTIMATE</u>	<u>PRIOR YR OBLIG</u>	<u>FY 00 YTD OBLIG</u>	<u>PROJECT BALANCE</u>
1	TOTAL DZERO UPGRADE PROJECT	41,593.2	33,989.2	4,009.5	3,594.5
1.1	TRACKING DETECTORS	20,097.6	16,773.0	2,725.6	599.0
1.1.1	SILICON TRACKER	7,857.1	6,166.1	1,584.5	106.5
1.1.2	FIBER TRACKER	7,774.3	6,976.3	694.8	103.3
1.1.3	CENTRAL PRESHOWER DETECTOR	238.2	228.2	0.0	10.0
1.1.4	FORWARD PRESHOWER DETECTOR	524.3	500.3	14.6	9.4
1.1.5	TRACKING ELECTRONICS	3,703.7	2,902.1	431.7	369.9
1.2	CALORIMETER	4,656.8	4,163.4	131.2	362.2
1.2.1	FRONT-END ELECTRONICS	4,347.6	3,915.5	90.8	341.3
1.2.2	INTERCRYOSTAT DETECTOR	309.2	247.9	40.4	20.9
1.3	MUON DETECTORS	9,493.1	7,839.9	654.8	998.4
1.3.1	COSMIC RAY SCINTILLATOR	1,223.2	963.2	0.0	260.0
1.3.2	CENTRAL TRIGGER DETECTORS	951.9	713.6	68.1	170.3
1.3.3	FORWARD TRIGGER DETECTOR	2,133.3	1,673.1	60.2	400.0
1.3.4	FORWARD TRACKING DETECTOR	1,410.8	953.8	331.5	125.5
1.3.5	FRONT-END ELECTRONICS	3,773.9	3,536.2	195.0	42.7
1.4	TRIGGER	6,599.6	4,919.5	324.6	1,355.6
1.4.1	FRAMEWORK	1,859.4	1,859.4	0.0	0.0
1.4.2	LEVEL 0	136.4	124.2	6.4	5.8
1.4.3	LEVEL 1	1,515.1	1,120.0	207.9	187.2
1.4.4	LEVEL 2	2,039.8	1,002.3	100.9	936.6
1.4.5	LEVEL 3	1,049.0	813.7	9.3	226.0
1.5	ONLINE EQUIPMENT	746.0	293.4	173.4	279.2
1.5.1	ON-LINE EQUIPMENT	746.0	293.4	173.4	279.2
<hr/>					
3.1	TOTAL SOLENOID PROJECT	5,168.0	4,848.2	37.4	282.4
3.1.1	SOLENOID	5,168.0	4,848.2	37.4	282.4

DEFINITION OF TERMS:

Funds:	DØ Upgrade = M&S Equipment Funds; Solenoid = AIP Plant Funds.
Cost Estimate:	Total Project and Sub-Project Budgets without contingency.
Prior Year Obligations:	Obligations for fiscal years '92 through '99 as applicable.
FY 00 Year-to-Date Obligations:	Obligations for fiscal year '00.
Project Balance:	Cost Estimate - (Prior Year Obligations + Fiscal 00 YTD Obligations)
DØ FY 00 Plan:	The M&S funds allocated to the Project/Sub-Projects as extracted from the current schedule.
DØ FY 00 Balance:	DØ FY 00 Plan - FY 00 Year-to-Date Obligations

DØ Upgrade Monthly Progress Report

for the month of June, 2000



	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
YTD ACTUAL	962.6	1,199.8	1,664.6	2,169.3	2,546.1	2,855.8	3,077.4	3,623.2	4,009.5			
YTD PLAN	962.6	1,199.8	1,664.6	2,169.3	2,546.1	2,855.8	3,077.4	3,421.4	4,141.4	4,975.4	5,555.4	5,775.4

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Active MOUs as of 6/30/00

<u>INSTITUTION</u>	<u>EQUIPMENT</u>	<u>R&D</u>	<u>COSTED</u>
Boston University	298,200	5,200	35,093
Brookhaven National Laboratory	236,439		181,247
Brown University	820,076	106,000	161,319
California State University, Fresno	26,160		4,083
Columbia University, Nevis Labs	140,000		107,937
DAPNIA / Saclay	0	0	0
IN2P3	0	0	0
Indiana University	65,000		31,585
Institute for High Energy Physics (IHEP)	270,433		107,838
Kansas State University	113,300	92,512	107,789
Louisiana Tech University	80,854		56,917
Michigan State University	226,087		68,744
Moscow State University	23,250		0
NIKHEF / Amsterdam	0	0	0
Northern Illinois University	133,000	28,000	130,872
SUNY at Stony Brook	1,105,750	20,000	490,133
University of Arizona	820,598	78,100	474,299
University of Calif, Davis		9,720	0
University of IL, Chicago	129,103	22,000	91,042
University of Kansas, Center for Research, Inc.	16,000		1,889
University of Maryland	0		0
University of Nebraska, Lincoln	0		0
University of Notre Dame	190,500	77,000	102,097
University of Oklahoma	43,000		33,210
University of Texas, Arlington	126,764		116,623
<u>University of Washington</u>	<u>50,640</u>	<u>5,250</u>	<u>38,538</u>
 Total Fermilab Funds:	 \$4,915,154	 \$443,782	
 Total Costed:	 2,112,677	 228,577	 <u>\$2,341,254</u>
 Total Open Commitments:	 <u>\$2,802,477</u>	 <u>\$215,205</u>	

DØ Upgrade Monthly Progress Report

for the month of June, 2000

Reportable Milestones Summary

<u>Done</u>	<u>Reportable Milestones</u>	<u>Project</u>	<u>Date</u>	<u>Baseline</u>	<u>Var.</u>
X	M1-Solenoid Delivered to Fermilab	Solenoid	5/12/97	5/12/97	0 w
X	M2-VLPC Production 50% Complete	VLPCs	8/31/97	8/31/97	0 w
X	M2-Central Preshower Module Fabrication Complete	Central Preshower	12/16/97	12/16/97	0 w
X	M2-Central Preshower Installed on Solenoid	Central Preshower	5/21/98	5/21/98	0 w
X	M1-Solenoid Installed and Tested	Solenoid	9/30/98	9/30/98	0 w
X	M2-Muon Forward Trigger Counter Assembly 10% Complete	Muon Forward Trigger	10/12/98	10/12/98	0 w
X	M2-Forward Preshower Module Fabrication Begun	Forward Preshower	11/4/98	11/4/98	0 w
X	M2-Muon Forward Tracker MDT Assembly 10% Complete	Muon Forward Tracker	1/29/99	1/29/99	0 w
X	M2 - Assembly Design Complete	Fiber Tracker	3/5/99	3/5/99	0 w
X	M2-First Cylinder Complete	Fiber Tracker	9/2/99	9/2/99	0 w
X	H Half-Wedge Fabrication 20% Complete	Silicon Tracker	10/15/99	10/15/99	0 w
X	3 Chip Ladder Fabrication 80% Complete	Silicon Tracker	10/26/99	10/20/99	0.6 w
X	Arrival Of C-Layer MDT Modules At FNAL	Muon Forward Tracker	11/3/99	10/22/99	1.7 w
X	9 Chip Ladder Fabrication 20% Complete	Silicon Tracker	11/4/99	11/3/99	0.2 w
X	M3-Fiber Tracker Ribbon Fabrication 50% Complete	Fiber Tracker	11/5/99	11/12/99	-0.9 w
X	First Readout Crate Installed & Working	Silicon Electronics	11/16/99	12/2/99	-2 w
X	SCA Testing Complete	Calorimeter Electronics	11/23/99	12/15/99	-2.8 w
X	MDT ADB Fabrication Complete	Muon Electronics	12/2/99	12/2/99	0 w
X	SLICs Received	Trigger	12/10/99	11/10/99	4 w
X	F Wedge Assemblies 20% Complete	Silicon Tracker	1/24/00	1/19/00	0.4 w
X	6 Chip Ladder Fabrication 20% Complete	Silicon Tracker	1/31/00	1/3/00	3.9 w
X	MDC Fabrication Complete	Muon Electronics	1/31/00	12/13/99	5 w
X	M2-Muon Electronics Preproduction Installation Complete	Muon Electronics	1/31/00	12/13/99	5 w
X	M2-Fiber Tracker Assembly Begun	Fiber Tracker	2/1/00	12/6/99	6.2 w
X	M3-Establish Single Crate Internal Data Movement	Trigger	2/17/00	1/6/00	6 w
X	Shaper Hybrid 50% Complete	Calorimeter Electronics	2/22/00	5/9/00	-11 w
X	All Pixel Octants Assembled	Muon Forward Trigger	2/23/00	4/4/00	-5.8 w
X	M3-1st Forward Preshower Detector Complete	Forward Preshower	2/24/00	1/12/00	6.2 w
X	M3-Fiber Tracker Cylinders 8, 7, 6, and 5 Complete	Fiber Tracker	3/2/00	1/28/00	5 w
X	Steady DAQ Running	Online	3/17/00	3/31/00	-2 w
X	H Half-Wedge Fabrication 80% Complete	Silicon Tracker	3/29/00	2/23/00	5 w
X	M2-All Muon Forward Tracker MDT Modules At Fermilab	Muon Forward Tracker	3/30/00	3/10/00	2.8 w
X	Module Fabrication and Testing Complete	Forward Preshower	4/1/00	12/10/99	14 w
X	M3-2nd Forward Preshower Detector Complete	Forward Preshower	4/3/00	3/8/00	3.6 w
X	FEB, CB Production Complete	Muon Electronics	4/10/00	1/3/00	14 w
X	M3-ICD Tile Modules/Boxes Ready	Intercryostat Detector	4/19/00	1/18/00	13.2 w
X	M2-ICD Modules Arrive at Fermilab	Intercryostat Detector	4/24/00	1/25/00	12.8 w
X	M3-InterCryostat Detectors Installed	Intercryostat Detector	5/5/00	2/1/00	13.6 w
X	M3-Level Ø-South Installed	Luminosity Monitor	5/8/00	2/9/00	12.6 w
X	M3-Fiber Tracker Ribbon Fabrication Complete	Fiber Tracker	5/10/00	3/6/00	9.5 w
X	M3-Fiber Tracker Ribbon Mounting Complete	Fiber Tracker	5/13/00	4/20/00	3.3 w
X	M2-Fiber Tracker Assembly Complete	Fiber Tracker	5/26/00	5/4/00	3.3 w
X	6 Chip Ladder Fabrication 80% Complete	Silicon Tracker	7/12/00	3/14/00	16.8 w
X	M2-Calorimeter Preamp System Test Complete	Calorimeter Electronics	7/13/00	3/31/00	14.4 w
X	M2-First Silicon Tracker Barrel/Disk Module Complete	Silicon Tracker	7/28/00	1/24/00	26.4 w
X	10 Digital Boards Available	Fiber Electronics	7/28/00	3/22/00	18 w
	Waveguide Production 50% Complete	Fiber Tracker	7/31/00	1/29/00	25.7 w
	F Wedge Assemblies 80% Complete	Silicon Tracker	8/1/00	4/26/00	13.3 w
	9 Chip Ladder Fabrication 80% Complete	Silicon Tracker	8/2/00	3/27/00	17.9 w
	South H-Disks Ready to Move to DAB	Silicon Tracker	8/4/00	7/3/00	4.6 w
X	M2-Muon End Toroids Installed on Platform	Master	8/4/00	11/15/00	-14.2 w
X	Ten 8-chip Analog Boards Available	Fiber Electronics	8/8/00	4/19/00	15.4 w
	Preproduction MTCxx, MTFB, and MTCM Complete	Trigger	8/9/00	1/24/00	28 w

DØ Upgrade Monthly Progress Report

for the month of June, 2000

M3-VLPC Cryo System Operational	VLPCs	8/15/00	6/12/00	9 w
M3- Cal Readout Available to L2	Trigger	8/15/00	2/11/00	26 w
M3-Waveguide Production Complete	Fiber Tracker	8/16/00	6/5/00	10.4 w
SFE, SRC Fabrication Complete	Muon Electronics	8/16/00	2/3/00	27.5 w
M3-VLPC Cassette Assembly 50% Complete	VLPCs	8/17/00	4/12/00	17.7 w
MBTs Received	Trigger	8/28/00	3/16/00	23 w
B-Layer Octants Assembled	Muon Forward Tracker	9/1/00	4/18/00	19.2 w
All MDT Octants Assembled	Muon Forward Tracker	9/1/00	7/14/00	7 w
MRC, MFC Production Complete	Muon Electronics	9/1/00	3/27/00	22.4 w
M3-L3 Operational (One Full Chain)	Trigger	9/1/00	6/1/00	13 w
South Half-Cylinder Complete and Ready to Move to DAB	Silicon Tracker	9/11/00	8/1/00	5.8 w
Production MTCxx, MTFB, and MTCM Complete	Trigger	9/21/00	6/27/00	12 w
M3-Calorimeter CC, ECN Preamp Installation Complete	Calorimeter Electronics	10/6/00	3/31/00	26.4 w
Drawers Ready	Intercryostat Detector	10/6/00	12/14/99	40 w
M3-VLPC Cassette Assembly Complete	VLPCs	10/13/00	8/22/00	7.4 w
PDT Commissioning Complete	Muon Central	10/17/00	6/9/00	18 w
M3-Muon Level 1 Trigger Preproduction Testing Complete	Trigger	10/20/00	4/18/00	26 w
Global Installation Complete	Trigger	10/24/00	7/12/00	14.6 w
L2 Cal Installation Complete	Trigger	10/24/00	8/21/00	9 w
L2 CTT Installation Complete	Trigger	10/24/00	8/9/00	10.6 w
M3-All Silicon Tracker Barrels/Disks Complete	Silicon Tracker	10/27/00	8/25/00	9 w
North Half-Cylinder Complete and Ready to Move to DAB	Silicon Tracker	10/27/00	9/18/00	6 w
M1-Central Silicon Complete	Silicon Tracker	10/27/00	9/18/00	6 w
M1-Begin Shield Wall Removal/Ready to Roll-in	Master	11/1/00	11/22/00	-3 w
L2 Muon Installation Complete	Trigger	11/7/00	7/26/00	14.6 w
Muon Forward Tracker B-Layer Planes Installed	Muon Forward Tracker	11/9/00	6/15/00	20.6 w
All MDT Planes Installed	Muon Forward Tracker	11/9/00	8/4/00	13.6 w
Timing System Installed	Calorimeter Electronics	11/13/00	8/18/00	12 w
CFA Commissioning Complete	Muon Central	11/22/00	7/10/00	19.3 w
Daughterboard Vendor Production Complete	Calorimeter Electronics	11/29/00	6/16/00	22.8 w
Mixer Boards Ready	Fiber Electronics	11/30/00	6/22/00	22.2 w
BLS Motherboard Assembly Complete	Calorimeter Electronics	12/12/00	8/7/00	17.6 w
M2-Silicon Tracker Installed in Solenoid/Fiber Tracker	Silicon Tracker	12/15/00	9/25/00	11.6 w
All Muon Forward Trigger Detector Planes Installed	Muon Forward Trigger	12/15/00	8/25/00	15.4 w
Alpha Cards Received	Trigger	12/18/00	5/15/00	30 w
M2-Calorimeter BLS Assembly Complete	Calorimeter Electronics	1/8/01	9/26/00	13.6 w
Multichip Modules Received	Fiber Electronics	1/30/01	2/23/00	47 w
M1-Detector Rolled-in and Hooked Up	Master	2/6/01	2/2/01	0.4 w
M3-Trigger Level 2 Commissioned	Trigger	3/28/01	9/21/00	25.6 w